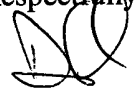
REMARKS

Amendments to the Specification have been made to correct obvious, inadvertant typographical errors.

Claims 5, 8, 9, 19, 27, 28 and 34 (now 33) have amended to remove multiple dependency. None of the amendments made herein constitutes the addition of new matter.

It is believed that this amendment does not necessitate the payment of any fees under 37 C.F.R. 1.16-1.17. If the amount submitted is incorrect, please deduct from Deposit Account No. 07-1969 the appropriate fee for this submission and any extension of time required.

Respectfully submitted,



Donna M. Ferber
Reg. No. 33,878

GREENLEE, WINNER AND SULLIVAN, P.C.
5370 Manhattan Circle, Suite 201
Boulder, CO 80303
Telephone (303) 499-8080
Facsimile: (303) 499-8089
Email: winner@greenwin.com

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Marked up version of amended paragraph(s) and claim(s) in attached Preliminary Amendment.

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At page 11, the last paragraph:

Figure [20]21 shows the results of PAGE over an 8-25% gradient gel with three disc samples which correlate with the sizes of the nanodisc particles.

At pages 21 and 22, the bridging paragraph:

The MSPs of the present invention are used in disks to solubilize, stabilize, manipulate membrane proteins. The MSPs of the present invention, when formulated onto disks, are applicable in surface technology such as biosensor chip for high throughput screening or solid phase assay techniques. Our work on disk scaffolds has also involved surface-associated assemblies. For instance, the SPR biosensor utilizes an approximately 50 nm thick gold film on an optical component to couple surface plasmons to a dielectric component (sample) at the surface of the gold film. MSP stabilized bilayers can be attached to the surface for use as a biomimetic layer containing proteins or other targets of interest by engineering cysteines into the MSP (Fig.15A). The use of thiols is well known for attaching molecules to gold surfaces. The placement of the cysteine depends on the model used for placement of the cysteine residue(s). Based on the belt model, cysteines can be placed along the polar side of the amphipathic helix axis, provided that a cysteine residue is not positioned at the helix-helix interface. The helix-helix interface of the belt is believed to be in register with the position of apo A-I Milano (R173C), which forms disulfide-linked dimers (Segrest et al., 1999). An alternative is to introduce cysteines within a flexible N- or C-terminal linker. Such a construct is, in theory, capable of associating either the belt or the picket fence form of disk to a gold surface. Alternatively, thiol lipids can be incorporated within the bilayer domain. In addition to SPR, surface-associated disks on gold

can be used in STM and electrochemical studies, for example, such as with membrane associated redox proteins, e.g. cytochrome P450 and its flavoprotein, as well as ion channels.

In the Claims:

5. (Once amended) The membrane scaffold protein of [any of] claim[s] 1 [to 4], wherein said membrane scaffold protein self assembles in the absence of phospholipid to form a nanoscale particle between about 5 nm and about 500 nm in diameter.

8. (Once amended) The membrane scaffold protein of [any of] claim[s] 1 [to 7], wherein said membrane scaffold protein comprises an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:9, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:23, SEQ ID NO:29, SEQ ID NO:43, SEQ ID NO:44 and SEQ ID NO:45.

9. (Once amended) A nanoscale particle comprising the membrane scaffold protein of [any of] claim[s] 1 [to 8] and at least one hydrophobic or partially hydrophobic protein, and optionally further comprising a phospholipid or a mixture of phospholipids, wherein said nanoscale particle has a diameter between about 5 nm and about 500 nm.

19. (Once amended) The nanoscale particle of [any of] claim[s] 9 [to 18], wherein said membrane scaffold protein comprises an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:9, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:23, SEQ ID NO:29, SEQ ID NO:43, SEQ ID NO:44 and SEQ ID NO:45.

27. (Once amended) The method of [any of] claim[s] 20 [to 26], wherein said membrane scaffold protein comprises an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:9, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:23, SEQ ID NO:29, SEQ ID NO:43, SEQ ID NO:44 and SEQ ID NO:45.

28. (Once amended) The method of [any of] claim[s] 20 [to 27], wherein said at least one hydrophobic or partially hydrophobic protein is associated with membranes or membrane fragments.

[30]29.(Once amended) A method for identifying an competitor of binding of a ligand to a receptor protein wherein said receptor protein is incorporated within a nanoscale particle together with a membrane scaffold protein, said method comprising the steps of:

(a) contacting a nanoscale particle comprising a membrane scaffold protein and a receptor protein with a detectable ligand to produce nanoscale particle-bound detectable ligand;

(b) contacting the nanoscale particle-bound ligand with a test compound;

(c) measuring detectable ligand released from the nanoscale particles;

whereby a competitor of ligand binding is identified when contacting the nanoscale particle-bound ligand results in release of the detectable ligand.

[31]30.(Once amended) The method of claim [30]29, wherein said receptor protein is a membrane protein.

[32]31.(Once amended) The method of claim [31]30, wherein said receptor protein is a G-protein coupled receptor.

[33]32.(Once amended) The method of claim [32]31, wherein said G-protein coupled receptor is a 5-hydroxytryptamine receptor.

[34]33.(Once amended) The method of [any of] claim[s 30 to 33] 29 to 32, wherein said membrane scaffold protein comprises an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:9, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:23, SEQ ID NO:29, SEQ ID NO:43, SEQ ID NO:44 and SEQ ID NO:45.

[35]34.(Once amended) A DNA molecule encoding a membrane scaffold protein, wherein said membrane scaffold protein comprises an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:9, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:23, SEQ ID NO:29, SEQ ID NO:43, SEQ ID NO:44 and SEQ ID NO:45.

[36]35.(Once amended) A recombinant host cell comprising the DNA molecule of claim [35]34.